

CLAIMS

1. A system for geometric measurement and analysis of a three-dimensional object, which is characterized in that it comprises:

5 a) a variable-phase filter having a fixed reflector and a movable reflector whose position can be changed along an optical axis;

 b) a separating optics for guiding zero-order light to the movable reflector or the fixed reflector and higher-order diffraction light to the fixed reflector or the movable reflector, where the two kinds of light come from each point of a target object irradiated with

10 low-coherent white light;

 c) an interference optics system for guiding the reflected zero-order light and the reflected higher-order diffraction light to substantially a same point;

 d) a photo-receiver for measuring a strength of the interference light; and

 e) a position-determining and analyzing unit for determining a position of each point

15 of the target object in a direction of the optical axis and/or for determining a composition of each point of the target object, on the basis of a change in the strength of the interference light measured by the photo-receiver, while moving the movable reflector along the optical axis.

20 2. The system for geometric measurement and analysis of a three-dimensional object according to claim 1, which is characterized in that an attenuation filter is provided before a component of the variable-phase filter that reflects the zero-order light.

25 3. The system for geometric measurement and analysis of a three-dimensional object according to claim 1 or 2, which is characterized in that the light cast onto the target

object has an annular form and the movable reflector of the variable-phase filter correspondingly has an annular form.

4. The system for geometric measurement and analysis of a three-dimensional
5 object according to claim 1 or 2, which is characterized in that the light cast onto the target
object has a spot-like form and the movable reflector of the variable-phase filter
correspondingly has a spot-like form.

5. The system for geometric measurement and analysis of a three-dimensional
10 object according to one of claims 1-4, which is characterized in that the movable reflector of
the variable-phase filter uses a piezoelectric element.

6. The system for geometric measurement and analysis of a three-dimensional
object according to one of claims 1-5, which is characterized in that it further comprises a
15 means for measuring an amount of motion of the movable reflector.

7. The system for geometric measurement and analysis of a three-dimensional
object according to claim 6, which is characterized in that the means for measuring the
amount of motion of the movable reflector of the variable-phase filter employs interference
20 of two rays of split light.

8. The system for geometric measurement and analysis of a three-dimensional
object according to claim 6, which is characterized in that the means for measuring the
amount of motion of the movable reflector uses a capacitance sensor.

9. The system for geometric measurement and analysis of a three-dimensional object according to one of claims 1-8, which is characterized in that a light source and the separating optics are located on the same side of the target object.

5 10. The system for geometric measurement and analysis of a three-dimensional object according to one of claims 1-8, which is characterized in that a light source is located in opposition to the separating optics across the target object.